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AUTHOR Wright, M. Anthony; Long, James S.
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ABSTRACT

Extension leadership articulated several broad goals for the use of microcomputers within cooperative extension. These included providing information, service to clients, office automation, and enhancement of the educational process. A questionnaire was administered regarding microcomputer use within Washington State University County Cooperative Extension Offices. Questions were directed towards the use of microcomputers as educational and office automation technologies. Thirty-five of the 39 counties in Washington had responded. In Fall 1985 Washington county extension offices used the microcomputer about 16.9 hours per week. Hourly use was split evenly between office staff and county agent faculty. Indicators chosen to reflect county computer use all showed dramatic increases in use related to the length of time a computer is in the office. Following national trends, county extension offices' primary current utilization of microcomputers was office automation. The ranking of office automation as first was not a disappointment, since the equipment could be economically justified solely on the basis of general purpose word processing. Another beneift was increased educational sophistication due to computing use. Recommendations were that agents need time and commitment to learn how to use a computer and that a traditional coordinated curriculum approach is needed to introduce new computer-based educational tasks. (YLB)

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Indicators for Evaluating County Extension Office Computer Uses

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by M. Anthony Wright, Computer Coordinator
James S. Long, Evaluation Specialist
Cooperative Extension, Washington State University

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Introduction

Over the past few years, cooperative extension has jumped upon the information bandwagon. A great deal of money, labor, promises, and frustrations have gone into "computerizing" extension. How can we tell if we are on track? Can we dramatically change the direction of the "moving train"? Do we want to change directions?

The purpose of this paper is to identify empirical criteria for evaluating extension computer use. This cannot be accomplished without first delineating extension computing goals. Finally, along the way, we will look at Washington state county extension offices' uses of computers and the congruence of these uses with nationally articulated goals.

Educational Process and Support Goals

Extension leadership, at the federal, regional, and state level, has articulated several broad goals for the use of microcomputers within cooperative extension. These "computerization" goals range from providing information, service to clients, office automation, and enhancement of the educational process.

Extension, if it is nothing else, is an educational institution concerned primarily with adult (continuing) and youth (4-H) education. Our current educational technologies combine adult and youth education processes with subject matter expertise. Our dominant goal with regard to computer use should therefore be within the educational arena.

Many interpretations of this goal have centered around the ability of the computer to solve analytical subject matter problems. In particular, using models developed by land grant researchers, microcomputers will allow county extension agents to perform (or teach how to perform) whole farm analysis (or some other similarly complex data analysis). Prior to the advent of computers, this type of educational service would not have been possible. Now that we have microcomputers in all Washington county offices (and nearly 50% of the county offices nationwide), it seems appropriate to begin striving towards this goal.

An articulated subsidiary supporting goal is general office automation. An office automation goal usually centers on the increase in office personnel utilization and efficiency. Hence, it indirectly supports the educational process. For most microcomputers, this goal would include such tasks as word processing, office records management, education

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materials preparation, and communications. When this goal is articulated by many educational leadership positions, it is often demeaned because it concerns itself with "lesser" support functions rather than the real business of education.

1985 WSU Extension Computer Use Survey

The research portion of this paper was accomplished by administering a questionnaire in September, 1985 about microcomputer use within Washington State University County Cooperative Extension Offices. Questions were directed towards the use of microcomputers as educational and office automation technologies. Overall response to the questionnaire was good. At the time of this draft, 35 of the 39 counties in Washington had responded.

WSU began distributing IBM-PCs to county offices over two years ago. PCs were distributed to county offices in three groups of 13 during the summers of 1983, 1984, and 1985. As of July 1985, all county offices had IBM-PCs. This cross-temporal questionnaire, administered shortly after final PC distribution, will enables us to compare use patterns associated with initial post-installation, one year after, and two years after installation. This snapshot can illuminate some aspects of the processes involved when a microcomputer is incorporated into a county office's environment.

For the most part, each set of 13 offices was similar to each other except that larger offices tended to receive PCs before the single county agent offices. Training procedures were standardized; all offices received approximately the same preinstallation training. This was accomplished by a requirement that two thirds of the county agents and at least one secretary from each office must attend a five day preinstallation training session on campus. The receipt the office's PC was contingient upon training.

While a very detailed questionnaire querying use patterns was used, the information contained in this paper shall deal with only major trends. This analysis should be considered by the reader as preliminary. A full analysis shall be published at a later date.

The survey is based on the belief that indicators of use must be empirical. Hence, the survey's goal was to discover hourly use per week by type of office worker, number of times the computer was accessed per week, number of times that staff were unable to access the computer, usage rates on the kinds of programs, programs' primary and secondary users, number of program procedures written by office staff, and the number and kind of educational sessions.

Findings

Washington county extension offices in the fall of 1985 utilized the microcomputer about 16.9 hours per week. The hourly use is split evenly (51.9% and 48.9% respectively) between office staff (secretaries, other

staff, aides, and volutuneers) and county agent faculty. The computer is used about 17 times a week; word processing and other general office management tasks account for about 80.5% of that total. Direct faculty use of educational programs occupies the remainder at about 19.5%. Following national trends, WSU county extension offices' primary current utilization of microcomputers is office automation.

HOURLY USE: Looking at the distribution of hourly use by the number of years the microcomputer has been installed, we can see how the use has changed. Total use for newly installed machines is about 9.8 hours per week. This average rate grows through the first year to 13.2 hr/wk and by the end of the second year it reaches 29.2 hr/wk. At the end of the first year, faculty use (7.73 hr/wk) exceeds office staff use (5.5 hr/wk) by nearly 2 hours. This trend reverses itself by the end of the second year when office staff (18 hr/wk) exceeds faculty use (11.2 hr/wk) by 6.8 hours.

NUMBER OF WEEKLY USES: The number of times the computer is accessed per week (excluding the daily electronic mail call) reflects directly the hourly use. The mean number of computer accesses was 16.99 times per week. We again can see the growth in the numbers of weekly accesses from 10.25 to 27.05 from newly installed machines to two year old ones. Faculty and staff use rates are also split similarly as for hourly use. We have no survey information about the variance of the length of time computer tasks take.

MAIL LABEL LISTS: One easily measured indicator of microcomputer use is the time spent on mail label lists and the number of mail label addresses. This is not a perfect measure since several offices utilize their county government's administrative computer and high speed printer rather than their own microcomputer.

Further reducing the need for microcomputer mail label lists at the county level Washington state is the fact that for over ten years we have had a complete centralized 4-H enrollment and publication distribution system. Mail labels and list are available at no cost throguh this centralized system. In many states this task is accomplished only at the county level and hence is a major component of their local offices' computing.

On the average, counties spend about 2.05 hours per week on the microcomputer-based addressing system. The mean number of addresses per county in these systems is 1365. The average number of addresses for new, first, and second year counties is respectively 175, 1365, and 1704, while the average hours per week at microcomputerized mail labels tasks is 1.15, 1.93, and 3.05 hours.

INABILITY TO ACCESS: The above survey information indicates a steady growth in computing over time. The largest growth in county office computing was for office automation tasks performed by staff rather than county agents. This growth could potentially block computer access by county agents. In fact, it was reported that there were 5.33 times a week that faculty and staff were unable to access the computer because someone else was using it. As can be expected, when the total weekly

use goes up the number of blockages increases from 1.0 to over 12.5 times per week.

The increasing weekly hourly use and the inability to access the computer suggests an upper usage level that can be reached by many offices towards the end of the second year. The primary pressure on use is from office automation rather than direct educational uses. This pressure can lead to conflicts.

Computer educational uses among faculty can be divided into four major categories: 1) preparation of educational materials, 2) analytical /subject matter problem solving and information access, 3) computer procedures written by county faculty and staff, and 4) educational sessions.

HOURS OF EDUCATIONAL PREPARATION: In a typical week, there were about 3.45 hours in educational preparation by primarily faculty members. This includes both preparation of materials and problem solving tasks on the microcomputer. Even those offices with a recent PC installation were preparing materials about 2.3 hrs/wk, while one and two year users devoted 4.1 and 3.9 hrs/wk respectively to this purpose.

This measure of preparation time does not include word processing or newsletter article development by faculty. Several comments were made on the questionnaires that faculty used the word processing programs for these tasks. In fact, several did work related word processing at home on their own microcomputers.

ANALYTICAL PROBLEM SOLVING AND INFORMATIONAL ACCESS: Using a computer for the analysis and solution of complex subject matter problems is an exciting aspect of the new computer revolution. Faculty within Washington have two major sources of computerized analytical models. About five years ago Washington became an AGNET partner state, this allowed immediate access to over 200 interactive models and informational programs. Secondly, county microcomputers are also used by faculty for problem solving. Finally, Washington agents also have access to the WSU host computer which has, among other things, a pesticide data base of all legally registered pesticides in the states of Oregon, Idaho, and Washington.

During the past year, the typical county office accessed problem solving or information programs on PCs and main frame hosts an average of 165 times. Interestingly, those offices who just received their machines used their microcomputer for problem solving only 5.45 times and accessed host-based main frame systems 34.34 times last year even though they had a "dumb" terminals. For those who have had their machine for one and two years they respectively accessed their microcomputers 100.3 and 103.2 times, while accessing host-based systems 126.5 and 104.9 times last year. The presence of a microcomputer in an office may have a synergistic effect on increasing all computing activities whether based at the office microcomputer or on the campus main frame host.

PROCEDURES WRITTEN: While county agents, and for that matter state specialists, are not required nor expected to write computer programs, many of the software packages in offices allow for the construction of

procedures. For example, a specialized mail label database can be designed and implemented. Similarly, spreadsheets for the Lotus 1-2-3 can also be constructed. The number of these procedures written can be a very good indicator of the general level of user's computer knowledge and sophistication.

On the average, faculty (and sometimes staff) have written an average of 10.1 procedures. As the time increases within an office (from newly installed through 2 years later) and the level of user knowledge increases, the number of procedures written is, respectively, 2.1, 10.9, and 18.8.

EDUCATIONAL SESSIONS USING MICROCOMPUTERS: The number of educational sessions is another indicator of microcomputer use. These sessions can be divided into two board categories of service orientation and demonstration orientation. A service oriented session is one in which a specific problem is solved for an individual or small group (including some classroom situations). A demonstration may not solve a pressing problem, but is used for transferring information.

A typical county had 12.7 educational sessions using its microcomputer. Of the sessions,70% were service oriented, while the remainder were classroom demonstrations. Those counties who just received their computer averaged 0.38 sessions, while those that have had it for one or two years averaged 16.3 and 19.67 sessions in the past year.

Discussion

Clearly, the indicators chosen to reflect county computer use have all shown dramatic increases in use related that are related to the length of time a computer is in the office. This is congruent with casual observations of counties' use and discussions with county agents. Given the busy nature of extension work, it takes a while for computer use to take off.

Given the importance of the educational goals of extension, at first it seems disappointing that the major use of computers is office automation. Certainly our primary domain is education, not running an office. Yet office automation ranks first in total access time.

Simply counting the number of hours for each use implies that the an hour of educational use is equivalent to an hour of office automation use. Perhaps this is an error in the data evaluation procedures. A weighting system may need to be designed and established for critical and noncritical uses.

But should we be disappointed that office automation ranks first? Perhaps, we should not be. At the simplest level, the equipment can be economically justified solely on the basis of general purpose word processing alone. Then on this strong base we can add the benefits of other office tasks and also the increase in our educational sophistication due to the computing use. When these things are considered, computing in the county office becomes very beneficial.

Office automation programs also provide a bridge to more complex programs. One reason for their relative higher speed of acceptance is that office automation programs, on the whole, are easy to learn and have immediate use. The programs have a generalized functionality adaptable to all offices. Finally, they alleviate fear of the machine by performing common office tasks.

But again, why does office automation rank above educational delivery? At the simplest level, the secretary has experience with a keyboard and most faculty have little. If it has a keyboard, many assume that it must be associated with secretarial tasks. Also inhibiting faculty use is the insecurity of not knowing where the keys are and the fear of hitting a key that would destroy the computer. This real fear has certainly slowed the learning process for many faculty.

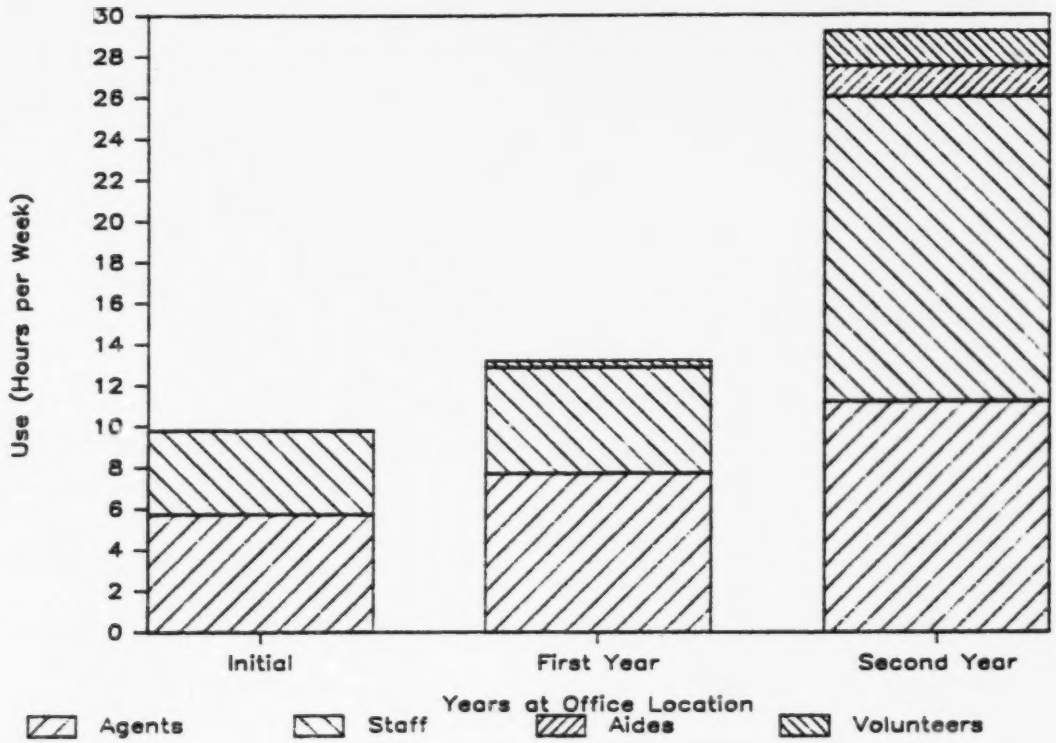
What must we do to strengthen the agents' use of computers? It takes time and commitment to learn how to use a computer. Educational program administrators need to realize this. They need to make appropriate adjustments in agent program assignments. They need to reward technical innovation and creativity.

Program leaders need to recognize that the existence of subject matter problem solving programs does not insure that they will be used. There are a large number of reasons for this, including such things as fear of the computer, lack of time, or unfamiliarity of the subject matter. More simply, agents may have the perception that the program is not of use to them. We can change that perception by making models that directly relate to what agents do in their own counties. By helping them in tasks that they perceive as important, we can greatly increase their computer use.

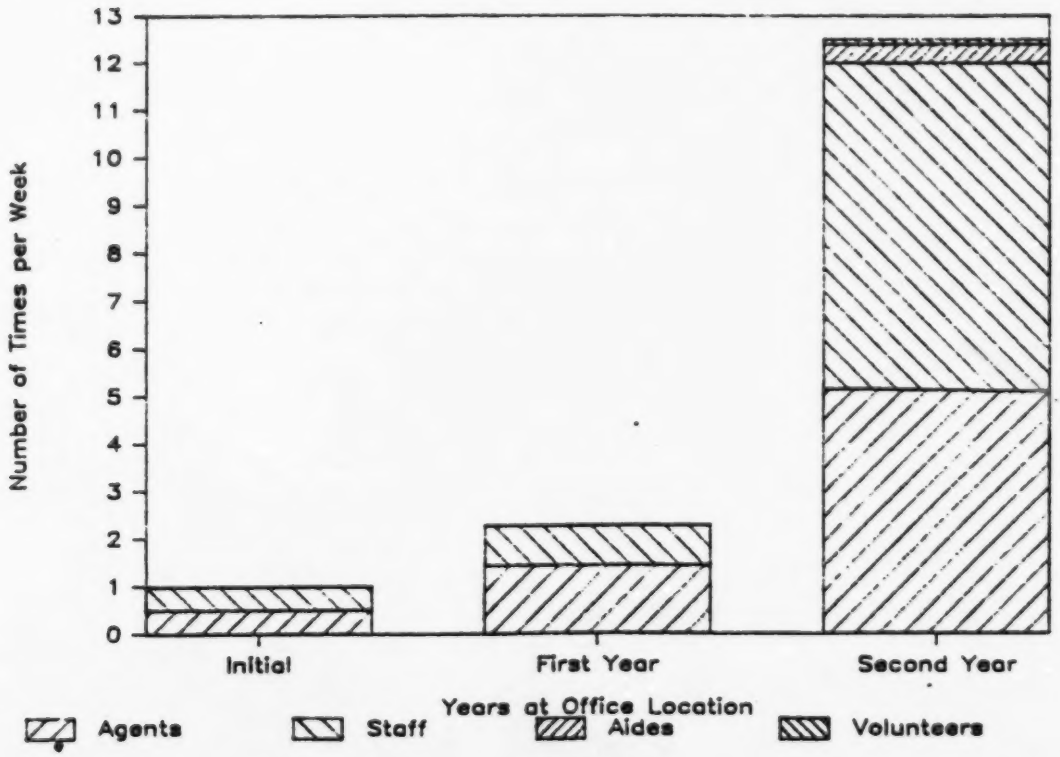
Similarly, if we want to introduce new computer based educational tasks, then we need to develop a coordinated curriculum approach to the process. Simply handing out disks with nifty analytical programs on it will not insure their incorporation into the county educational process. We need to couple analytical programs with teaching guides and with training sessions on the program's use in an educational setting. In brief, we need to follow a traditional coordinated curriculum approach which we are ready to begin now at Washington State University.

The long journey of institutionalizing computing must begin with a first step. Our first steps were programmable calculators, then AGNET interactive programs, and now office automation using microcomputers. Our next steps will deal with computers in the educational process.

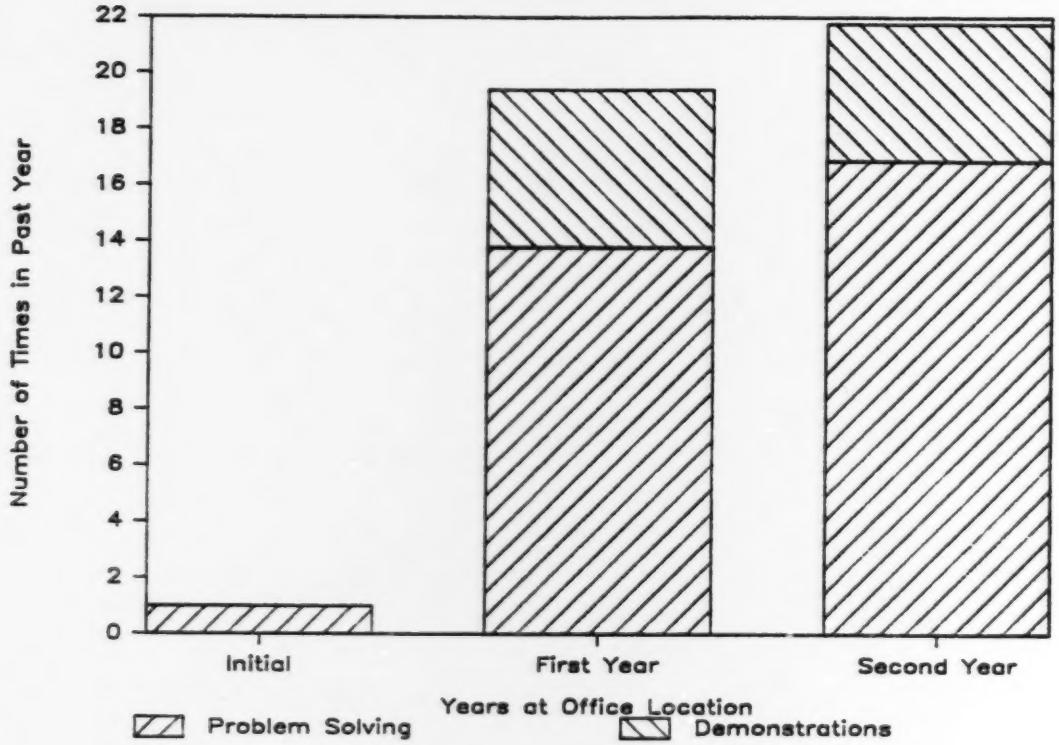
Microcomputer Use in County Offices



Blocked Access by Staff



Educational Sessions



Problem Solving & Information Access